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January 30, 1996

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

VIA HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, DC 20554

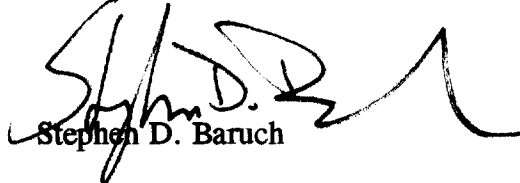
Re: Ex Parte Presentation in
CC Docket No. 92-297

Dear Mr. Caton:

On January 29, 1996, TRW Inc. made a written ex parte presentation to Scott Harris and Mark Grannis of the Commission's International Bureau, and to Donald Gips and Gregory Rosston of the Commission's Office of Plans and Policy. A copy of the presentation is enclosed.

Pursuant to Section 1.1206 of the Commission's rules, the original and one copy of this letter are being submitted for inclusion in the docket file of the above-referenced proceeding.

Respectfully submitted,


Stephen D. Baruch

SDB/kbs
Enclosures

cc (w/encl.): Scott B. Harris (By Hand)
Mark Grannis (By Hand)
Donald Gips (By Hand)
Gregory Rosston (By Hand)

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MEMORANDUM

January 29, 1996
(Via Telecopy)

TO: Scott Harris
Don Gips
CC w/encl.: Mark Grannis
Greg Rosston

FROM: Norm Leventhal

RE: Summary of 28GHz NGSO/MSS Sharing Solutions

I know that you both do not feel a need to meet on this subject any further, so I thought I would take the opportunity to forward TRW's summary of where the sharing solutions stand with respect to NGSO/MSS.

We are presently working with Hughes, Motorola and others in hopes of finalizing agreed upon positions in time for next week's meetings.

Norm

January 1996

THE TRW ODYSSEY™ CASE FOR ALLOCATION OF THE FREQUENCY BANDS 29.1-29.5 GHz AND 19.3-19.7 GHz TO NGSO/MSS FEEDER LINKS ON A SHARED BASIS

In the comments and reply comments that were filed in response to the Commission's Third Notice of Proposed Rule Making in CC Docket No. 92-297, TRW Inc. was an ardent supporter of the Commission's band segmentation plan. It accepted the plan as a rational compromise, and backed up its acceptance with technical studies that demonstrated the feasibility of sharing among two NGSO/MSS feeder link systems (specifically, Odyssey™ and Iridium), and between NGSO/MSS feeder link systems and, respectively, LMDS and GSO/FSS systems.

The Commission's plan formed the basis for the U.S. spectrum allocation and designation proposals that were taken up at WRC-95. Although final designation of an additional 100 MHz of spectrum in each direction for the NGSO/FSS and for NGSO/MSS feeder links was deferred to WRC-97, the Final Acts of WRC-95 are fully consistent with the Commission's band plan, and would permit its implementation.

Over the last several weeks, TRW has conducted comprehensive analyses and simulations, and has presented to the Commission's staff and interested parties its conclusions that Odyssey™ is capable of operating on a co-frequency basis with both the LMDS and the Iridium NGSO/MSS feeder links in the 29.1-29.25 GHz band (and with Iridium in the companion downlink band at 19.4-19.6 GHz), and with Iridium and GSO/FSS in the 29.25-29.5 GHz band. The following points are the key elements of TRW's analyses, and explain why the plan should be implemented without substantive modification in order to allow the expeditious completion of the licensing processes for the Odyssey™ and Iridium NGSO/MSS systems and the establishment of the LMDS, NGSO/FSS and Ka-band GSO/FSS services:

ODYSSEY™ OVERVIEW

- Odyssey™ requires an absolute minimum of 300 MHz of spectrum in a single sense of polarization (at 29.1-29.4 GHz, Earth-to-space, and 19.3-19.6 GHz, space-to-Earth) for its feeder link and on-orbit TT&C operations. In accordance with the decision in CC Docket No. 92-166, TRW has applied to the Commission to modify its authorization for Odyssey™ to specify the bands designated at WRC-95 for global NGSO/MSS feeder link operations.

- ▶ In the Americas, TRW plans to perform its feeder link operations from only two earth station complexes in North America and one earth station complex in South America. Coastal regions are being sought to minimize interference potential over land.
- ▶ The 12 Odyssey™ satellites will follow repeating ground tracks from highly-inclined orbits, and will employ spot beam antennas that effectively limit the coverage regions of its 30/20 GHz band footprints to the vicinity of its earth station complexes.
- The Commission must recognize that its suggestion (made in the Third NPRM) that Odyssey™ could operate on a reverse-band basis in the 19 and 15 GHz bands is now absolutely precluded as a result of actions taken at WRC-95. At WRC-95, stringent operating conditions were placed on the use of the 15.45-15.65 GHz band for NGSO/MSS feeder links in the space-to-Earth direction, and it would be virtually impossible for a medium Earth orbit NGSO/MSS system to comply with the new conditions.

LMDS

- Odyssey™ can share the band 29.1-29.25 GHz with the LMDS, as proposed in the Third NPRM.
 - ▶ It is not significant to Odyssey™ whether LMDS operations in that band are limited to hub-to-subscriber links as proposed by the Commission, or include subscriber-to-hub and/or hub-to-hub backbone links as some LMDS interests apparently desire.
 - ▶ TRW is willing to accommodate LMDS by locating its earth station complexes outside of the largest 25 metropolitan areas in the United States
 - ▶ LMDS systems can locate near Odyssey™ earth stations. However, they would have to accept interference from Odyssey™ that, at ranges of 40 kilometers or less, may hinder or even preclude some operations.

IRIDIUM

- Odyssey™ can share the bands 29.1-29.3 GHz and 19.4-19.6 GHz with the Iridium NGSO/MSS feeder link system, fulfilling the Commission's desire (from the Third NPRM) to satisfy the feeder link requirements of two NGSO/MSS systems in the bands 29.1-29.5 GHz and 19.3-19.7 GHz. Iridium does not dispute this conclusion.
- Sharing between Odyssey™ and Iridium only requires that the systems operate on opposite polarizations and with a geographic separation of 250 kilometers or more between their respective earth station complexes. In addition, some power control measures may need to be employed.

GSO/FSS

- Odyssey™ can share the bands 29.25-29.5 GHz and, if necessary, 19.45-19.7 GHz, with the GSO/FSS.
 - ▶ Because of the design features of the Odyssey™ system, there is only a limited opportunity for potential interference between Odyssey™ and co-frequency GSO/FSS systems.
 - ▶ Because the GSO/FSS systems all contemplate substantial frequency re-use, and are still at preliminary stages of frequency planning, it will not be burdensome to plan around Odyssey™'s earth station complexes.
 - ▶ There will be no interference between Odyssey™ and a GSO/FSS system under any of the following circumstances:
 - ▶▶ The GSO/FSS system uses any of the non-overlapping 850 MHz of spectrum that is to be assigned to the GSO/FSS service for the beam(s) that covers the Odyssey™ earth station complex; or
 - ▶▶ The GSO/FSS system uses the opposite sense of polarization from Odyssey™ in the 150 MHz of overlapping spectrum for the beam(s) that covers the Odyssey™ earth station complex; or

- ▶▶ Co-frequency, co-polarization operation of proximately-located GSO/FSS earth terminals is restricted to large (i.e., 1.8 meter in diameter or greater) terminals within any overlapping beam; or
- ▶ Fully 40% of the possible locations in the worldwide geostationary arc will never experience an instance of coincidence with any of the 12 Odyssey™ satellites that would require any of the four mitigating measures to be employed.
- Under the Odyssey™ solution, and despite extremist assertions that are being made by certain parties with multifaceted agendas, GSO/FSS operators are *not* being asked to cease operations for up to two minutes per day. To the contrary, it is expected that through a relatively simple, case-by-case coordination process, one of the several available mitigation techniques can be employed to ensure that both systems can operate at full capacity at all times from all desired locations.

DOWNLINK BAND (17.7-20.2 GHz) CONSIDERATIONS

- There is strong sentiment for a segmentation solution in the downlink band that would enable NGSO/MSS feeder links to operate in the band 19.3-19.6 GHz that was designated for global use at WRC-95, while GSO/FSS would gain access to a 250 MHz segment of the band 17.7-18.55 GHz that is unpaired (since LMDS only operates in the 28 GHz band).

EQUITABLE TREATMENT OF COMPETING SERVICES

- To the extent that the Commission is prepared to adjust the band segmentation plan from the parameters proposed in the Third NPRM, and requires one or more services to sacrifice spectrum, such sacrificing should be parceled out on a pro rata basis; specifically, each service category should be asked to give up a roughly similar percentage of the allocation proposed for it in the band plan proposed in the Commission's Third NPRM.
 - ▶ An alternative band plan that would reduce the allocation to LMDS from 1000 MHz to 975 MHz (a 3 % reduction); the GSO/FSS allocation from 1000 MHz to 875 MHz (a 12.5 % reduction); the NGSO/MSS feeder links from 400 MHz to 275 MHz (a 25 % reduction); but would keep the proposed allocation to the single NGSO/FSS system at 500 MHz (representing a 0 % reduction, and granting to a single entity exclusive use of fully 20 % of the total spectrum that is to be licensed to hundreds of additional parties), is grossly inequitable.
 - ▶ In order for the final Commission band segmentation plan to enable the expeditious initiation of any of the underlying services, the final compromise must reflect a rational and fair departure from the current proposal, and be designed on its face to withstand judicial scrutiny.

PROTECTION OF U.S. OPPORTUNITIES FOR SUCCESS AT WRC-97

- The United States worked extremely hard, and against long odds, at WRC-95 to preserve the opportunity for the designation at WRC-97 of an additional 100 MHz in each direction for the NGSO/FSS and NGSO/MSS feeder links. The credibility of the United States would be greatly compromised if the Commission were to take any action in this proceeding that prejudices the ability of NGSO systems to use the respective bands if the allocations are made. Designation of the full 500 MHz proposed for NGSO/FSS and the full 400 MHz proposed for NGSO/MSS feeder links must continue to be pursued with vigor between now and WRC-97. Failure to aggressively pursue both designations will compromise future U.S. negotiating positions on a variety of issues.